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# Japan Report

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No. 76

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## MILITARY

### DEFENSE AGENCY ANNOUNCES FY '78 MEDIUM-TERM DEFENSE PLAN

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 pp 3-6

[Text] The Japanese Defense Agency (JDA) July 17 announced the FY '78 Medium-Term Defense Plan which covers five years, FYs '80-'84, calling for total expenditure of ¥2,800,000 million. The FY '78 MTDP is the first five-year plan of JDA after the four five-year defense buildup programs which ended in March 1976. Unlike the five-year programs of the past, the MTDP is based on a year-by-year estimate for modernization of major equipment and service reorganization. Featuring flexibility, the plan is subject to review after three years. The next MTDP will be made in FY '83.

Equipment to be procured under the '78 MTDP include 390 aircraft, 39 warships, 300 tanks, 180 self-propelled guns, 110 armored vehicles, and various types of guided weapons, for upgrading quality rather than quantity.

Plans for improved electronic warfare capabilities include modernization of the BADGE (base air defense ground environment) system, establishment of radar, radio communication and ECM networks. Nike and Hawk ground-to-air missiles will be modified for improved performance.

Main equipment to be procured during the '78 MTDP follows.

<u>Item</u>	<u>Quantity</u>
*GSDF	
Main battle tanks	300
Self-propelled guns	180
Armored carrier vehicles	110
Antiship/tank missile launchers	33 sets
HU-1H multi-role helicopters	44
Large transport helicopters	3

Improved Hawk ground-to-air missiles	Two groups
Tan-SAM short-range surface-to-air missiles	24 sets

**\*MSDF**

39 warships including:

Destroyers	16
Submarines	5
Minesweepers	11
Lockheed P-3C antisubmarine aircraft	37
Sikorsky HSS-2B antisubmarine helicopters	51
Minesweeping helicopters	6
US-1 sea rescue flyingboats	2
Rescue helicopters	8

**\*ASDF**

McDonnell Douglas F-15 fighter-interceptors	77
Grumman E-2C airborne early warning aircraft	4
F-1 support fighters	13
T-2 advanced trainers	23
Rescue helicopters	13
Nike-J ground-to-air missiles	One company

Major plans for reorganization call for activation of an armored division, the first of its type for the GSDF, at Chitose based on the present 7th Division. At Shikoku, a mixed brigade will be activated. The MSDF's flight squadron in Okinawa will be strengthened to become the 5th Fleet Air Wing. The ASDF will activate an AEW squadron with E-2C Hawkeyes.

Personnel of the Self-Defense Forces will be increased. At present, personnel in service with the ASDF and MSDF is 96 percent of authorized strength. The ASDF will recruit 1,800 and the MSDF 3,650 personnel so that strength will reach 98 percent. The GSDF will increase its personnel from the present 86 percent to 89 percent of authorized strength. The age limit will be extended while welfare measures will be improved. The number of reserve personnel will also be increased, 5,000 for the GSDF and 1,500 each for the MSDF and the ASDF.

Organization of the Self-Defense Forces at the end of FY '84 follows, according to the FY '78 MTD.



#### **GSDF**

##### **Main units:**

**Regular units stationed throughout the country:**

12 divisions and 2 mixed brigades

##### **Mobile units:**

1 armored division, 1 artillery brigade, 1 airborne brigade,

1 instructor brigade, and 1 helicopter brigade

##### **Low-altitude antiair missile units:**

8 groups

#### **MSDF**

##### **Main units:**

Antisubmarine surface units (task force) 4 flotillas

Antisubmarine surface units (coastal defense) 10 divisions

Submarine units 6 divisions

Minesweeping units 2 flotillas

Land-based ASW air units 14 squadrons

(Main equipment for the above are 58 surface ships, 14 submarines, and approximately 180 aircraft)

#### **ASDF**

##### **Main units:**

Aircraft control and warning units 28 groups

Interceptor fighter units 10 squadrons

Support fighter units 3 squadrons

Reconnaissance unit 1 squadron

Transport units 3 squadrons

Early warning unit 1 squadron

High-altitude antiair missile units 6 groups

(The number of aircraft for the above is approximately 340)

CSO: 4120

## MILITARY

### ASDF E-2C PROGRAM--FY '79 BUDGET AUTHORIZED

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 pp 6-7

[Text] The Speaker of the House of Representatives and the President of the House of Councillors authorized July 12 use of the funds in the FY '79 budget for procurement of four Grumman E-2C airborne early warning aircraft for service with the ASDF. The aircraft are to be procured through FMS (foreign military sales) contracts between the US and Japanese governments. Official action for the E-2C procurement had been shelved for about three and a half months, pending clarification that the ASDF decision did not involve any illegal political transactions. The Diet (Parliament) failed to uncover any illegal transactions connected with the E-2C procurement program.

Following approval, Ryoza Tsutsui, director in charge of development planning, Equipment Bureau, JDA, and Lt. Col. Hiroyuki Mori of the Procurement Sec., Equipment Div., Air Staff Office, left Japan for the US. They will remain in the US until July 20. They will visit the Department of Defense, the Naval Operations Command, Naval Air Systems Command, Grumman and other offices to prepare for conclusion of the FMS contracts on the ASDF E-2Cs.

Considering the required procedures in both countries, the FMS contracts are expected to be concluded in August. Based on the contracts, the US Navy will place orders with Grumman in October for ten aircraft, six for the US Navy and four for the ASDF. Deliveries of the ASDF E-2Cs will be made during FYs '82 through '83.

A total of \$36,380 million has been approved for the ASDF E-2C program, including \$34,293 million for four complete aircraft and \$2,087 million for related equipment and systems. Under the FY '79 budget, \$1,151 million will be disbursed for aircraft and \$522 million for related equipment and systems.

JDA plans to send a survey mission to the US in August to study maintenance and support equipment for operation of the E-2Cs. The mission will visit US Navy facilities and installations as well as manufacturers such

as Grumman, Allison, Hamilton, Litton, Hazeltine, and General Electric. Studies by the mission will provide data for procurement requests in FY '81.

The ASDF plans to procure eight E-2C aircraft, all through import. Airframe manufacturers such as KHI and MHI are asking JDA for a future contract for total overhauls of the E-2C including the airborne electronic systems to gain expertise for designing of future AEW aircraft. However, electronics companies are insisting that they should be assigned maintenance and overhaul work on the avionics. JDA is expected to decide on which to use before the end of March 1980.

Training of ASDF crews for the E-2C is being planned through FMS contracts. Funds will be requested in the FY '80 budget for training of about 120 personnel in the US during FYs '80 through '82.

A provisional plan calls for training of 10 programmers in FYs '80-'81, 95 mechanics in FYs '81-'82, and 15 pilots in FY '82.

The E-2C for the ASDF will differ from the US Navy type in avionics configurations for integrated operations with the F-15 fighter and the BADGE (base air defense ground environment) system of the ASDF.

CSO: 4120

## MILITARY

### HITACHI SELECTED FOR E-2C BUFFER SYSTEM PRODUCTION

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 p 7

[Text]

The Japanese Defense Agency (JDA) has selected Hitachi Ltd. for design and production of the communications buffer system which links the ASD F E-2C AEW aircraft with the BADGE air defense environment system, it was revealed July 18. JDA plans to request funds for construction of the buffer system in FY '80 so that it will be completed before service introduction of the Grumman aircraft.

The buffer system is required for efficient operation of the E-2C and the BADGE systems since the aircraft was originally designed for the US Navy under a different operational environment. It consists of data processing equipment and transmitter/receiver radio.

Hitachi was reportedly selected because of its experience in design and production of data link systems for the ASD F F-4EJ and F-104J fighter-interceptors.

CSO: 412C



## MILITARY

### ASDF PLANNING F-4EJ PILOT TRAINING IN UNITED STATES

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 pp 7-8

[Text] The Air Self-Defense Force is preparing to send senior fighter pilots to the United States for flight training, starting from FY 1981, sources say. Negotiations are now under way between the Japanese Defense Agency and the US defense authorities. The US has reportedly expressed willingness to accept the Japanese request and it is scheduled to be studied at the next working-level meeting of the Japan-US council on security affairs to be held at the end of July or early August.

Approximately 2,000 pilots now in service with the ASDF have been trained in Japan. The ASDF has, however, been facing difficulties in efficiently training F-4EJ pilots in such advanced combat exercises as Mach 2 flights, night flights and missile launching due to limited air space since the McDonnell Douglas aircraft was placed in service about three years ago.

Discussions on possible training of F-4EJ pilots in America was first held between officials of the ASDF and the USAF in January 1978. The plan did not progress mainly due to the high level of training and related costs. Since the guide line on defense cooperation between Japan and the US was announced November 1978, however, both parties have resumed talks on promoting pilot training efficiency. A joint exercise of the ASDF and the USAF recently took place over Japanese air space.

Senior ASDF officials have visited and talked to officials of the US Department of Defense and the USAF on use of USAF bases by Japanese pilots and estimates of procuring necessary equipment were obtained.

According to present ASDF planning, a group of approximately 24 senior F-4EJ pilots will be sent to the US at one time. They will be trained by American instructors for about six months in advanced combat missions. The aircraft to be used for training will be leased and other items necessary for training will be purchased from the US. The ASDF also wants these pilots trained in interception of modern fighter aircraft.

JDA plans to finalize the training program and to request about \$1,000 million for procurement and training equipment in FY '80. The first group of ASDF F-4EJ pilots are scheduled to be sent to the US in FY '81, according to present ASDF/JDA planning.

## MILITARY

### MSDF P-3C PROCUREMENT PROGRAM FOR FY '80

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 p 8

[Text]

Following the first eight aircraft ordered in FY '78, the MSDF plans to purchase 10 Lockheed P-3C antisubmarine patrol aircraft in FY '80. While the first eight aircraft are to be imported through FMS contracts, aircraft under the second and subsequent contracts will be manufactured in Japan under license.

Airborne equipment such as AYA-8B, ASA-70, ASA-66, ASA-76, CY-2461A, ARR-72, and ARA-50 systems are on order for local production for the aircraft under the first contract. For those under the second contract, additional equipment will be ordered for local production. These orders will include ASW-31, APX-76, APN-187, APS-115, LTN-72, AQA-7, ASQ-81(V), and ARC-143 systems. DIFAR (directional frequency analysis and recording) and INS (inertial navigation system) are also being considered for local procurement, sources say.

The MSDF is authorized to procure 45 P-3Cs. Those under the second contract will be of the same configuration as the first eight. If the US Navy effects improvement or modification to its latest version of the aircraft the MSDF may follow suit.

CSO: 4120

## **MILITARY**

### **MARITIME FORCE PLANNING HARPOON FOR FY '80 SUBMARINE**

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 pp 8-9

[Text] An unconfirmed report indicates that the Maritime Self-Defense Force is considering installing the McDonnell Douglas Harpoon antiship missile aboard the 2,200-ton submarine which it will request for funding in FY 1980.

Under the FY '80 shipbuilding program the MSDF plans to request funds for construction of such frontline warships as four destroyers (types still undecided), a 2,200-ton submarine and a 3,600-ton submarine tender.

If the MSDF plan for the Harpoon program is approved, the FY '80 submarine will become the first to be equipped with this antiship missile. The missile will be housed in a capsule and be launched from a torpedo tube and no major change in structure will be required, sources say. The missile will be separated from the capsule immediately after leaving the sea.

Funds for the missile and the capsule will probably be requested after construction starts, provided the missile program is approved.

CSO: 4120

## **MILITARY**

### **MSDF WANTS OWN COMBAT AIRCRAFT FOR FLEET AIR DEFENSE**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 p 9**

**[Text]**

In a long-term equipment study, the MSDF wants to deploy shipborne combat and strike aircraft such as the Harrier and the Lockheed S-3A Viking, for air defense of the MSDF fleet.

Up to the present, the MSDF has been building its air arm centered around land-based long-range antisubmarine patrol aircraft. Now that the P-3C program has started, the MSDF intends to study requirements for shipborne combat and strike aircraft of its own for air defense of MSDF fleets or convoys. Ranges of the ASDF F-1 support fighter and the F-4EJ fighter-interceptor are regarded insufficient to meet MSDF requirements. Such circumstances may lead to deployment of through-deck ships of the HMS Invincible class although there is no plan for such ships.

The MSDF presently has only two ocean-going antiaircraft destroyers, "Amatsukaze" and "Tachikaze." Needs for shipborne combat and strike aircraft for the MSDF fleet are reportedly being prompted by recent deployment of the aircraft carrier Minsk and other new ships in the Soviet Far East Fleet.

**CSO: 4120**



## MILITARY

### JDA PLANNING DEVELOPMENT OF 'GUIDED BOMB'

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 pp 9-10

[Text] The Japanese Defense Agency (JDA) plans to request funds in FY '80 for development of a guided bomb. A conventional bomb will be used as the basic body and a flight control system and flaps will be attached to the bomb, according to present planning. The flight control system of the new bomb will be similar to that of a missile, and competition is expected among defense electronic and aircraft manufacturers for the development assignment, sources say.

The guided bomb JDA plans to develop will reportedly be similar to the "Smart Bomb" which the US forces used during the Vietnam war. A simple flight system will guide the bomb to a limited extent. Fixed objects and slow moving vehicles such as tanks are generally targets of the guided bomb. JDA and the Self-Defense Forces also plan to use the guided bomb against landing ships.

According to the basic plan by the Technical R&D Institute which will take initiative in the development work, the bomb will be equipped with either a small television camera or an infrared-ray radar system. It will be guided by using several flaps. No propulsion system will be used.

Mitsubishi Electric and Toshiba have experience in development and production of missile guidance systems. Kawasaki Heavy Industries and Mitsubishi Heavy Industries also have the same capabilities.

JDA is now emphasising improvement of quality and performance rather than quantity of weapons systems as is the case with the new guided bomb, and the TR&DI considers it an efficient and inexpensive weapon.

CSO: 4120

## **MILITARY**

### **DEFENSE AGENCY ISSUES ANNUAL WHITE PAPER**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 pp 7-8**

**[Text]**

The Japanese Defense Agency (JDA), in an annual white paper issued last week stressed that Japan must quickly build up its defense capability to cope with the Soviet Union's military buildup in the Far East.

The white paper reviewed Russia's defense efforts in greater detail than in the past and stated that the Soviet Union now rivals the United States both in nuclear capability and military position in Europe and the Far East. "This compels the Western allies to institute a serious restudy of the present military balance between the two superpowers," the paper said.

It detailed the Soviet deployment of ground troops in the Kunashiri and Etorofu islands, east of Hokkaido, and assignment of the newest aircraft carrier Minsk to the Soviet Pacific Fleet.

In response to these developments in the areas surrounding this island nation, Japan must make greater efforts to quickly attain the levels of defense capability as specified in the outline of the basic defense power build-up plan adopted by the National Defense Council and subsequently approved by the Cabinet on Oct. 29, 1976, the paper said.

It calls for the formation of Japan's first fully armored division for deployment in Hokkaido and introduction of a Grumman E-2C Hawkeye squadron to improve the air defense capabilities against low flying intruders. It also calls for procurement of advanced military aircraft such as the McDonnell Douglas F-15 and the Lockheed P-3C.

As usual, this year's white paper consisted of three parts - the international military situation, Japan's defense policy, and the present state of Japan's defense and problems it faces.

Reviewing the international military situation in Part I, the white paper said that the Soviet Union has been building up its armed forces at a pace

much faster than any of the Western powers. The situation now is that the United States does not necessarily lead the Soviet Union in all fields such as strategic and tactical nuclear arms or naval and air force equipment, much less in the number of ground troops, it said.

The white paper warned that the quantity of strategic nuclear weapons held by the Soviet Union, their improved accuracy of striking targets, and an increased Soviet capability of naval presence in oceans could immensely affect the global military situation, depending on how the West is prepared to respond.

The paper analyzed that China's approach toward the West has complicated its relations with the Soviet Union, and said Moscow's response to this lies behind the undergoing changes in the Asian regions surrounding China.

It said that the Soviet Far Eastern forces have now come to possess a capacity that deserves particular attention from the standpoint of Japan's national defense.

It said that the aircraft carrier Minsk, which joined the Far East fleet based in Vladivostok earlier July, could be used as a means of intervening in localized warfare in the region. The vessel will also provide the fleet with air support capability in outer oceans and add to its antisubmarine combat capability and ability to land troops in trouble areas, it added.

The paper stated that Japan is concerned over the Soviet Union's "permanent use of airport and port facilities in Indochina," which it said will affect the security of Japan's maritime transportation.

It also expressed "major concern" about the abrogation of the U.S.-Taiwan Mutual Defense Treaty that followed Washington's normalization of relations with Peking in January.

After reviewing all these developments, the paper called for swift attainment of the "targets" set in the 1976 outline of the basic defense power build-up plan, and made it clear that modernization of the SDF's main equipment should be given top priority in the present fiscal year ending March 1980.

The paper also underlined the need for continued study of new legislation to cope with an emergency and possible operations to be done by the SDF to repel surprise attacks. But it clearly stated that such study must be made under strict civilian control.

The white paper contained nothing new in appraising the Japan-U.S. Security Treaty. But it featured the new guidelines on joint Japan-U.S. military action in emergency concluded by the two countries last November, saying that the arrangement "enhances the effectiveness of the security treaty as a deterrent and contributes toward maintaining the peace and security in the Far East as well as Japan's own security."

## **MILITARY**

### **NEW MSDF DIPPING SONAR IN FUNCTIONAL TESTS**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 pp 8-9**

**[Text]**

To replace the ASQ-13 series, a new dipping sonar is proving satisfactory in functional tests which began last month. Developed by the TR&DI and MSDF, the new dipping sonar, to be operated by antisubmarine helicopters, features wider range, advanced data processing, and improved reliability. In addition to the CW (continuous wave) mode, the new sonar transmits signals in the pulse modulation mode. The search beam is said to have directivity.

Designing of the new sonar was contracted to NEC in FY '72. In FY '77 the prototype system was completed and functional tests began in FY '78. It is planned that the new sonar will enter service during FY '79.

The first MSDF aircraft to be equipped with the new sonar will be eight HSS-2B antisubmarine helicopters to be ordered in FY '79. All of the HSS-2Bs are for shipborne operations, one is scheduled for a 2,900-ton DD funded in FY '77, and one for a 5,200-ton DDH funded in FY '76. The other six will replace HSS-2As aboard DDHs Haruna and Hiei.

**CSO: 4120**



## **MILITARY**

### **MANUFACTURERS ORGANIZE JOINT TEAM FOR CCV STUDY**

Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 p 9

[Text]

With ¥4,870 million, the TR&DI, has formed a project team headed by Gen. Junichi Aoki to launch the CCV (control-configured vehicle) study, one of the major "theme studies," in-house projects of the TR&DI, during the FY '78 MTDP.

In parallel with the TR&DI, a joint CCV project team has been organized by four airframe companies, MHI, KHI, FHI, and Shin Meiwa Industry. By using joint efforts, the industry intends to participate in the important study for the next-generation combat aircraft, which may replace the ASDF F-1 fighter.

The initial study on the CCV will include 1) general configurations of supersonic aircraft, 2) FBW (fly-by-wire) control system, and 3) actuators. Studies on these will be concluded by FY '81 to be incorporated into fabrication of a prototype CCV based on the T-2 airframe.

The airframe manufacturers jointly worked for designing and development of the T-2 trainer through forming ASTET (advanced supersonic trainer engineering team).

CSO: 4120

## MILITARY

### ASDF E-2C PROGRAM ON SCHEDULE

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 4

[Text]

#### \*Mission returns

Ryozo Tsutsui, director for development planning, Equipment Bureau, JDA, and Lt Col Hiroyuki Mori, Procurement Sec., Equipment Div., Air Staff Office, returned to Tokyo July 27, after completing negotiations with US authorities on procurement of four Grumman E-2C AEW aircraft for the Air Self-Defense Force.

Tsutsui and Mori left for the US immediately after the FY '79 appropriations for purchase of the Grumman aircraft and related equipment were released July 12 by Hirokichi Nodao, Speaker of the House of Representatives and Ken Yasui, President of the House of Councillors. The funds were "frozen" by the Diet (parliament) pending completion of investigations on allegations that there had been illegal monetary transactions concerning the sales of the Grumman aircraft to the ASDF. The Diet failed to discover any wrong activities concerning the selection of the E-2C by the ASDF.

Tsutsui and Mori negotiated with officials of the US Department of Defense, Office of Naval Operations, Naval Air Systems Command and other Navy offices responsible for the E-2C program as well as Grumman and other manufacturers in order to make up for the delay caused by the Diet proceedings. The Japanese officials have reportedly completed their mission and procurement will proceed on schedule.

#### \*US Navy support

The US Navy is expected to send a working team to Japan this fall to support Japanese introduction of the E-2C. Representatives of the ASDF and US Navy coordinators are scheduled to meet to prepare for operations, maintenance and support of the E-2C and related equipment which will be procured through the government-to-government FMS channel.

#### \*Crew training

The ASDF plans to train instructor pilots and other senior crew for its E-2C squadron in America and consequently introduction of a simulator system is not considered, a report says.

## MILITARY

### GREAT EXPECTATIONS FOR ASDF E-2C

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 pp 4, 5

[Text]

With funds for the first four Grumman E-2C aircraft released, the ASDF is speeding up preparations for its deployment. The four to be ordered this year will be delivered during the period, FYs '82 - '83. Four additional aircraft will be ordered in FY '81 for delivery by FY '85.

The ASDF plans to inaugurate an early warning squadron at Misawa directly under the Air Defense Command. The squadron will consist of two four-aircraft flights, according to present planning. A three-aircraft team will fly 24 hours a day, each team flying 8 hours.

During peacetime, it will be used for detecting low flying aircraft and helping friendly aircraft to intercept such intruders. It will also be used as a command post for sea rescue operations and as a communications link during natural disasters.

During emergencies, the E-2C will be used for controlling and commanding fighter-interceptor and surface-to-air missile units. If ground radar sites are destroyed, the Grumman aircraft will be able to take over their functions.

The patrol areas of the ASDF E-2C will change, depending on circumstances, however, two-point patrolling should suffice for the time being, inside sources say. The ASDF hopes to increase the number of AEW aircraft to 28 or thereabouts in the future. It is not known whether the E-2C will continue to be procured, or a new aircraft will be purchased.

CSO: 4120

## MILITARY

### SDF AIR POWER UNDER FY '78 MTD

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 pp 5, 6

[Text]

The air power of the Self-Defense Forces under the FY '78 MTD will be reorganized as follows:-

#### \*ASDF

The ASDF will procure a total of eight Grumman E-2C airborne early warning aircraft. In addition to the four aircraft to be ordered during FY '79, an additional four will be procured for deliveries of two annually. To operate the planes, the ASDF's first early warning squadron will be activated in or around FY '82 with the first four aircraft. The eight E-2Cs will be operated from two bases in northern part of Japan.

The number of combat aircraft of the ASDF at the close of the '78 MTD or FY '84 will be about 340. The figure is 90 aircraft short of the strength authorized in the Guidelines for Basic Defense Build-up Plan of 1976. This is because the strength of a support fighter squadron was lowered to 18 from 25 as the F-1 replaced the F-86F.

#### \*MSDF

The MSDF is authorized to deploy 16 antisubmarine squadrons. At the end of FY '79, there will be 15 squadrons. When the FY '78 MTD ends in FY '84, the strength will comprise 14 squadrons. This is due to lack of replacements for the S2F twin-engined ASW aircraft. The number of combat aircraft in FY '84 will be about 180, 40 aircraft short of authorized strength.

The 14 squadrons in FY '84 will comprise eight squadrons of the P-3C/P-2J, one squadron of the PS-1 ASW flyingboat, and five squadrons of antisubmarine helicopters.



The MSDF plans to reinforce the Okinawa Squadron in FY '80 by activating the 5th Air Group.

**\*GSDF**

The GSDF plans to activate 3.5 squadrons of the Bell AH-1S antitank helicopter. The GSDF took delivery of the first of the two AH-1S helicopters ordered in June. The AH-1S will undergo operational tests until July 1980. From April, 1980, the second helicopter will join the evaluation program.

Based on the test results, the GSDF intends to start the AH-1S program in FY '81. Of the 3.5 squadrons, two will be deployed in the Northern Army and one in the Western Army. One-half of a squadron will be operated by the flight training support unit.

One antitank helicopter squadron of the GSDF will comprise 16 AH-1S and four OH-6D helicopters. Procurement of 56 AH-1S helicopters is being planned through license production during FY '81 through '87.

CS0: 4120

## MILITARY

### ASDF PLANS 5TH F-15 SQUADRON

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 6

[Text]

Under the FY '78 MTDP, the ASDF plans to procure 145 aircraft including 77 F-15J/DJ fighters.

The ASDF is authorized to procure a total of 100 F-15 fighters to form four squadrons, to be deployed with six F-4EJ squadrons. It is anticipated, however, that one F-4EJ squadron is to be phased out in FY '86 and activation of a 5th F-15 squadron is being planned, to maintain the ASDF frontline strength at the authorized 10 interceptor squadrons.

The present F-15 program of 100 aircraft calls for orders of 23 in the first, 34 in the second, 32 in the third, and 11 in the fourth contract. The additional 23 aircraft for the 5th Eagle squadron will probably be requested in FY '82 for inclusion in the third and fourth contracts.

Other aircraft the ASDF plans to procure during the FY '78 MTDP include four E-2C airborne early warning aircraft, 13 F-1 support fighters, 23 T-2 advanced trainers, six V-107 helicopters, five MU-2 search aircraft, 10 T-3 basic trainers, and seven rescue helicopters. The C-X program, a replacement for the C-1 twin-jet transport, will be included in the FY '81 MTDP.

#### \*Replacement for Phantom

The ASDF plans to promote studies on a replacement for the F-4EJ fighter during FYs '80-'81 so that a selection program can be included in the FY '81 MTDP. The ASDF plans to replace the first of the present six F-4EJ squadrons with F-15s, increasing procurement of the aircraft from 100 presently authorized to 123. For replacement of further Phantoms, however, the ASDF will study the General Dynamics F-16, McDonnell Douglas F-18, Panavia Tornado, and Mirage aircraft as well as the F-15. As the ASDF is authorized to maintain 10 fighter-interceptor squadrons, requirements for the new fighter will be for five squadrons.

## MILITARY

### ASDF BADGE-X PROGRAM STATUS

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 7

[Text]

The ASDF plans to modernize the BADGE (base air defense ground environment) system during the FY '78 MTDP. Coded the BADGE-X, the program calls for assessment of capability of the present BADGE system during FY '79 for finalization of model specifications in FY '80. The modernized system will operate with the ASDF's new aircraft such as the F-15 fighter and the E-2C airborne early warning aircraft. The ASDF intends to select a Japanese manufacturer of the BADGE-X by August 1981 and request funds in FY '82.

CSO: 4120

## MILITARY

### ASDF TO PROCURE STINGER SAM FOR BASE DEFENSE

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 7

[Text]

The ASDF plans to procure the Stinger surface-to-air missile beginning with four to five sets planned for funding in FY '81, as one of the three weapons systems for air defense of ASDF airbases, radar sites, and Nike-J units. The other two weapons systems are the XM-167 20mm Vulcan guns and the Tan (Short)-SAM developed locally for the GSDF.

The first four sets of the XM-167 system will be procured in FY '79 to be followed by further sets in FY '80. The Tan-SAM is scheduled to be placed in production for delivery of 24 sets to the GSDF during the FY '78 MTDP.

The three weapons systems will replace 40mm machine guns now being phased out.

The MSDF also plans to strengthen air defense of its bases and procurement of common weapons systems will be promoted in parallel with the ASDF.

The GSDF, on the other hand, has a plan to deploy the Stinger SAM with field units and key facilities.

CSO: 4120

## **MILITARY**

### **NEW LANDING AID SYSTEM ADOPTED FOR PS-1 FLYINGBOAT**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 7**

**[Text]**

The JDA has adopted a new landing aid system for the PS-1 antisubmarine and US-1 sea rescue flyingboats presently in service with the MSDF. The decision followed successful conclusion of technical and operational tests of the system conducted in FY '78.

Both the PS-1 and the US - 1 are designed and built for landing on rough water (10-foot waves). But, the flyingboat is only equipped with a simple device to measure the wave height. The new system, developed in FY '76 and completed in FY '77 by the TR&DI, features a radio altimeter to measure not only wave height but also underwater movement. Data is analyzed by a computer for a display unit to assist the pilot in landing. It also includes an automatic engine control system.

Adoption of the new system is a significant milestone for improvement of the PS-1 flyingboat. The MSDF is promoting studies for improved performance of the PS-1 with a new sonar system and other antisubmarine warfare equipment and upgraded engines.

**CSC: 4120**



## MILITARY

### MSDF'S STUDY FOR MINE-LAYING AIRCRAFT

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 8

[Text]

The MSDF will promote studies on mine-laying aircraft during the FY '78 MTDP so that a procurement program is included in the FY '81 MTDP. The need for mine-laying aircraft has long been recognized by the MSDF for the defense of strategic sea lanes in case of a national emergency. Surface vessels cannot cover the planned areas in as short a time as mine-laying aircraft, while conversion of antisubmarine patrol aircraft such as the P-2J or the P-3C will reduce ASW strength, the MSDF maintains.

Due to range and warload requirements, the mine-laying aircraft the MSDF plans to procure will probably be of the Lockheed C-130 class. It is estimated that the MSDF will require six to eight such mine-laying aircraft.

Pending progress of studies during the FY '78 MTDP, the MSDF plans to order the mine-laying aircraft in or around FY '83.

CSO: 4120

## MILITARY

### V-107 REPLACEMENT FOR ASDF, GSDF

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 8

[Text]

During the FY '78 MTDP, both the ASDF and the GSDF plan to select a new large helicopter to replace the Boeing Vertol V-107.

The ASDF plans to procure 13 helicopters, seven of which are scheduled to be the H-X, a replacement for the V-107 presently used in rescue operations. Selection of the H-X is being studied in line with reorganization of the ASDF's air transport system. Such large helicopters as the civil version of the CH-47 Chinook and the CH-53E as well as H-60L medium helicopter, and an improved version of the V-107A are among the candidates for the ASDF H-X. The improved V-107A will be powered by more powerful engines and equipped with fiberglass rotor blades.

The GSDF plans to select a V-107-replacement in FY '82. The first three of the new helicopter type will be ordered in FY '83 for deliveries the following year. Selection of the new transport helicopter, however, depends on phasing out of the V-107s presently in service. The GSDF in FY '80 plans to start studies on methods to determine the service life of the V-107A in order to draft the timetable. It is expected that the GSDF's V-107 replacement program will be included in the FY '81 MTDP.

CSO: 4120

## MILITARY

### GSDP'S MAJOR EQUIPMENT PURCHASES DURING FY '78 MTDP

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 pp 8, 9

[Text]

Reflecting a major reequipment program, the GSDF during FY '78 MTDP will procure a large number of armored vehicles and self-propelled guns to upgrade mobility and fire power.

The vehicles include 301 Model 74 main battle tanks, 40 to 45 Model 73 armored personnel carriers, and 70 wheeled APCs. The Model 74 MBT will be procured at a rate of 60 units annually to build up total strength to 1,110 by the close of the FY '78 MTDP. The wheeled APC is a new type of equipment now in prototype development and about 70 units of the command/communication type will be procured from FY '81. Thirty Model 78 tank recovery vehicles, 150 Model 78 snow vehicles, and 12 Model 70 self-propelled pontoons will also be obtained.

For the artillery units, forty 203mm self-propelled howitzers will be introduced, along with 140 155mm Model 75 self-propelled howitzers and Model 75 130mm MSSR (multi surface-to surface rocket) launchers. Nine Model 75 wind measuring vehicles will be procured for the 130mm MSSR units at divisional level.

Other weapons the GSDF plans to introduce during the FY '78 MTDP include seven new 155mm howitzers, 200 Model 64 81mm mortars, 850 84mm antitank rocket launchers, 1,500 66mm antitank grenade systems, two sets of Model 64 antitank missile launchers, 33 sets of Model 79 antiship/tank missile launchers, 160 Model 62 machineguns, one set of the L-90 35mm antiaircraft machine gun, and 25,000 Model 64 rifles.

CSO: 4120

## **MILITARY**

### **MSDF SHIPBUILDING PROGRAM**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 9**

**[Text]**

The MSDF will construct 39 new ships during FY '78 MTDP, including two DDGs, 10 DDs, and four DEs. For FY '80, the first year of the FY '78 MTDP, funds will be requested for four DDs and one DE. The five submarines are of the advanced type and armed with Harpoon missiles.

Four Takatsuki-class DDAs and two Haruna-class DDHs will be modified under the FRAM (fleet rehabilitation and modernization) program for improved armament and extended service life.

Orders for one each of the missile-armed destroyers are planned for FY '81 and '83.

**CSO: 4120**

**MILITARY**

**GSD/TRA&DI PLAN FOR MORTAR-LOCATING RADAR**

**Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 9**

**[Text]**

The GSD/TRA&DI is requesting funds in the FY '80 defense budget draft to commence a program to develop new mortar-locating radar systems. Intended to replace the JMQ-N1 presently in service, the new radar system will have greater range, be able to detect multiple targets, and have better ECCM capability. Two types of the system will be developed self-propelled and tractor-drawn types.

The self-propelled unit will be mounted on a tracked vehicle such as the Model 60 APC presently in service.

**CSO: 4120**



## MILITARY

### GSDF TO PROCURE MOBILE GASTURBINE GENERATOR

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 pp 9, 10

[Text]

The GSDF intends to procure sample units of mobile gasturbine generators in FY '80 for operational evaluation. The GSDF presently operates diesel generators as power sources for radio equipment, radar systems, GCA (ground-controlled approach) systems, and mortar-locating radar units. The GSDF intends to replace these bulky and heavy generators with gasturbine units for better efficiency and mobility.

Gasturbine generators are in production in Japan but their output is too large for the GSDF. Different types of smaller output will be imported for the GSDF's study on modernization of power units for field use.

CSO: 4120

## MILITARY

### BRIEFS

**NEW ASW HELICOPTER**—The Sikorsky SH-60B LAMPS MK III of the US Navy is regarded as a strong candidate to succeed the HSS-2B antisubmarine helicopter in service with the MSDF. During the FY '78 MIDP, the MSDF plans to procure two new ASW helicopters for evaluation, first for shipborne operations. Under the FY '78 MIDP, the MSDF will procure 51 HSS-2Bs including 25 land-based and 26 for shipborne operations. The new ASW helicopter will first replace shipborne HSS-2Bs. [Text] [Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 p 9]

CSO: 4120

## ECONOMIC

### AIR INDUSTRY SALES OF 304,200 MILLION YEN EXPECTED IN FY '82

Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 pp 2-4

[Text]

Sales of five airframe and three aero engine manufacturers in FY '82 will total ¥304,200 million, a 26 percent increase over FY '78, according to a survey made by the Ministry of International Trade & Industry (MITI). In a report entitled "Status of the Japanese aircraft industry," MITI forecasts that the manhours required in the industry will begin to drop sharply from FY '80, especially in the aero engine plants, and unless new development projects are started there will be an "idle period" in the industry.

MITI's report is based on surveys made in early July. Five airframe manufacturers, MHI, KHI, FHI, Shin Meiwa Industry, and NIPPI (Japan Aircraft Mfg. Co.) and three aero engine manufacturers, IHI, KHI, and MHI provided MITI with data for the seven years, FYs '76 through '82. Figures included missiles, space, and industrial gasturbines. But, total sales of the six firms occupy about 85 percent of the turnover of the Japanese aircraft industry.

Gist of the MITI report follows:

#### Sales

Total sales of the industry in the past 10 years have registered an annual growth rate of 11.7 percent. In FY '78, annual sales totaled ¥279,300 million, ¥241,400 million of which were earned by six firms. The total sales of the six firms will continue to increase and amount to ¥304,200 million in FY '82, up 26 percent from FY '78.

Airframe production will continue to grow while engine output will peak in FY '81. Military contracts will account for major parts of the sales. But, the ratio will fall to 70 percent with increased production of civil aircraft such as the Y-X (Boeing 767 airliner), Mitsubishi MU300 business jet, and Kawasaki-MBB BK 117 utility helicopter. These civil aircraft will increase export sales.

### Employees

The number of employees has been decreasing. As of April 1, 1979, employees in the six firms totaled 17,141, including 12,820 in airframe and 4,321 in aero engine plants. The total in April 1982 will be 17,452 including 13,144 in airframe and 4,308 in engine production. Thus, the number of employees will remain unchanged.

### Manhours

Manhours have continued to decrease since the early '70s. Manhours totaled 18.32 million in FY '77. With start of the Y-X, F-15, and P-3C programs in FY '78, work increased. It is expected that manhours in FY '79 will reach 19.17 million.

Beyond FY '80, military sales, both airframes and engines, is expected to decrease.

In FY '82, manhours for airframe manufacture will be 3.21 million, a 26.9 percent increase from FY '78. But, the manhours in engine plants in FY '82 will be 0.583 million, a 29 percent decrease from FY '78. The utilization rate of employees required in FY '79 at airframe plants will be 115 percent, requiring overtime. The rate, however, will drop to 94 percent in FY '81. Similarly, the rate at aero engine plants will drop to 65 percent in FY '81 from 94 percent in FY '79.

Beyond FY '79, therefore, the industry will be confronted with an "idle period".

### Investment in Equipment and Facilities

The Y-X, F-15, and P-3C programs called for increased investment in equipment and facilities at the six firms. The investment in FY '78 by the five airframe manufacturers totaled ¥8,840 million. In the same year, the three engine manufacturers invested ¥2,650 million. In the case of airframe manufacturers, the amount in FY '78 was 2.8 times that of the previous year. In FY '79, airframe manufacturers will invest ¥1,980 million and engine manufacturers ¥540 million.

The ratio of investment against sales for FYs '76 through '82 will increase from 3.0% in FY '76 to 10.3% in FY '79 and then gradually decrease to 2.8% in FY '82.

Sales of the Japanese Aircraft Industry, FYs '76-'82

(Figures for FYs '76-'78 are actual and those for FYs '79-'82 are estimates. Percentage of sales against the combined sales of airframe and engine is shown in brackets. Unit is ¥100 million.)

	<u>FY '76</u>	<u>FY '77</u>	<u>FY '78</u>	<u>FY '79</u>	<u>FY '80</u>	<u>FY '81</u>	<u>FY '82</u>
<b>Airframe</b>	1,603 (73.4)	1,778 (75.9)	1,757 (72.8)	1,761 (72.1)	1,734 (72.5)	1,862 (68.0)	2,304 (75.7)
Manufacture	1,395	1,550	1,499	1,502	1,490	1,613	2,047
Repair	208	228	258	259	244	249	257
<b><u>Engine</u></b>	582 (26.6)	564 (24.1)	657 (27.2)	683 (27.9)	659 (27.5)	877 (32.0)	738 (24.3)
Manufacture	516	481	567	586	557	782	635
Repair	64	83	90	97	102	95	103
<b><u>Total Manufacture</u></b>	1,913 (87.6)	2,031 (86.7)	2,066 (85.6)	2,088 (85.4)	2,047 (85.5)	2,395 (87.4)	2,682 (88.2)
<b><u>Total Repair</u></b>	272 (12.4)	311 (13.3)	348 (14.4)	356 (14.6)	346 (14.5)	344 (12.6)	360 (11.8)
<b>Grand Total</b>	2,185	2,342	2,414	2,444	2,393	2,793	3,042
Percentage of military contracts	86.9	85.4	78.8	72.1	67.2	72.6	74.0
Percentage of export sales	1.8	2.6	6.7	9.0	12.0	8.3	10.3
(Total turnover of the industry)							
Total including airborne equipment	2,501	2,508	2,793	-	-	-	-
Percentage of military contracts	88.9	89.0	86.5	-	-	-	-
Percentage of export sales	2.0	2.4	3.5	-	-	-	-

CSO: 4120



## ECONOMIC

### MPC TO PRODUCE ASDF F-15 SIMULATORS

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 pp 3, 4

[Text]

Mitsubishi Precision Co. (MPC), a joint venture of Singer Co. and Mitsubishi Electric Corp., has concluded a licensing contract with Goodyear Aerospace Corp. (GAC), Akron, Ohio, on local production of the flight simulator for the Air Self-Defense Force F-15 fighter-interceptor.

The simulator consists of the instructor's control panel, six-axle simulation cockpit and controlling computer equipment. It can simulate environments in all normal interception missions as well as emergency operations.

GAC has designed and produced more than 100 flight simulators of various types over the past 29 years, including seven F-15 simulators for the US Air Force.

The simulator MPC will produce for the ASDF will be a version of the type GAC has designed for the USAF. It will incorporate necessary modifications in order to meet specific Japanese training requirements. The first MPC built simulator will be delivered to the ASDF in the latter part of 1981. The unit price of the ASDF F-15 simulator including spares will amount of approximately ¥4,400 million. Three to four F-15 simulators will be needed to meet pilot training requirements of the ASDF.

CSO: 4120

## SCIENCE AND TECHNOLOGY

### JFY 1979 SCIENCE AND TECHNOLOGY RELATED BUDGET TOPS 1 TRILLION YEN

Tokyo KAGAKU SHIMBUN in Japanese 22 Jun 79 p 2

[Text] The total amount of the science and technology related budget for JFY 1979 is 1,143.4 billion yen. This is made up of the following categories: science and technology promotion—347.1 billion yen, research and development under energy policy—168.2 billion yen, national educational institutions' special account—440.6 billion yen, and so on. The sum total of science and technology promotion fund and energy research and development fund is 515.3 billion yen. This constitutes 1.33 percent of the government's budget of 38,600.1 billion yen. The Science and Technology Agency recently evaluated and analyzed the features of the science and technology related budget and the trend demonstrated therein as follows.

#### General Status

Annual rate of increase in the science and technology promotion fund showed a declining trend from the oil crisis during the autumn of 1973 up until JFY 1977. But in JFY 1978, this changed to an upward swing, and this year, it registered an increase of 12.2 percent over JFY 1978—an increase almost equal to the [government's] general account budget increase. Energy countermeasures outlay from the general account budget, reflecting the urgency of this issue, shows a yearly increase. Moreover this category receives heavy funding from various types of special accounts.

With respect to expenditures related to Tsukuba Kenkyu Gakuen City, this being the year of establishment, 37.5 billion yen is apportioned as necessary fund for transfer of facilities and renovation of installations. Compared to the previous JFY allotment, this represents an increase of 300 percent. In recent years, the funds appropriated to national testing and research organs had been on the decline, but as a result of

implementation of transfer to Tsukuba, this trend has been reversed to an increase since 1977. With regard to normal operational appropriations of various testing/research organs, their operating costs are steadily increasing to meet the purchase of expensive machines and maintenance and management of large-scale equipments.

But the rate of increase for testing/research per se has been slight. In particular the increase rate for researcher's (sekisanchohi) (research outlay for a researcher) has been negligible. This money goes toward basic research for maintenance and improvement of research levels of national testing/research organs and the rate is subject to yearly review in consideration of inflation etc. This year, it increased by an average of 6 percent. And whereas traditionally there had been three unit cost categories, starting this JFY, there will be four categories. These are: Experimental Category I, II and Nonexperimental Category I, II. The unit costs for 1979 are: Experimental Category I--1.37 million yen; II--1.19 million yen; Nonexperimental Category I--860,000 yen; II--680,000 yen. The following 12 agencies were "promoted" as a result of the revision of the unit cost classification format.

(1) Those belonging to nonexperimental classification elevated to Non-experimental I category--Economic Research Institute, Ministry of Justice Research and Training Institute, Population Problems Institute, National Research Institute of Agricultural Economics; those promoted from Experimental I classification to Experimental II--National Research Center for Disaster Prevention, Fermentation Research Institute, Research Institute for Polymers and Textiles, National Laboratory for Industrial Products, Meteorological Research Institute, Industrial Safety Research Institute, Fire Research Institute, and International Latitudinal Observatory of Mizusawa.

## Health Ministry's Budget Shows Decline

### Analysis

Comparison of yearly budget increase rate and budget attainment ratio with respect to the science and technology promotion appropriation in the nine major agencies for the past 4 years revealed the following: The Ministry of International Trade and Industry figures have increased. The Welfare Ministry, Ministry of Education and Environmental Agency figures have declined. The Transportation Ministry and Ministry of Posts and Telecommunications figures are slowly going downward, and although the Ministry of Construction budget shows a high growth, the attainment ratio has declined yearly.

The Science and Technology Agency takes approximately half the science and technology promotion fund etc. Consequently its budget attainment ratio is higher than average, but its increase rate, too, is declining.

With regard to other items in the general accounts category, routine subsidies to private universities etc. comprise two-thirds of the total, and about one-sixth goes to the budget of the Defense Agency's Technological Research and Development Institute. Looking at the tally for the past 6 years, routine subsidies to private universities has increased 3.5 times and the appropriation going to the Defense Agency's Technological Research and Development Institute has increased 1.7-fold.

In the special accounts category, the national educational institution special account accounts for 95 percent of the total funding. Energy related appropriations have mushroomed 99-fold in the past 6 years, reflecting the importance of energy policy.

Classification of 318.4 billion yen expenditure--the portion of the science and technology related budget having clear disbursement objectives--according to the method detailed in the Science and Technology Council Report Number 6 yielded the following data: (1) science and technology expenditure for overcoming resource constraints--176.1 billion yen (previous fiscal year figure 148 billion yen), (2) science and technology related expenditure designed to provide a desirable living environment, resolution of environmental and safety problems and such--19.6 billion yen (13.1 billion yen), (3) science and technology expenditure for increasing and maintaining the health of citizens--15.4 billion yen (13.3 billion yen), (4) vanguard or ultramodern science and technology related expenditure--107.2 billion yen (96.3 billion yen). In funding to overcome resource constraints, nuclear energy development is given overwhelming prominence.

Though natural energy and fossil energy related amounts are small, the rate of increase in these categories is very high. Aside from these, notable growth was seen in expenditures relating to advancement of medical technology, YX development and development of magnetic levitation railroad technology. In the vanguard and basic science and technology field, the expenditure for space development and aviation technology accounted for 78 percent. Compared to the amounts appropriated the previous year, the space development registered a 2.6 percent increase, and Fan jet STOL aircraft research received about twice as much--1 billion yen. Ocean development received approximately 1.7 times as much or 5.7 billion yen, and materials science and technology was given roughly 3.5 times as much, an increase to 2.8 billion yen.

11460

CSO: 4105

## SCIENCE AND TECHNOLOGY

### STUDY ON FLYINGBOAT DEVELOPMENT TO BE PROMOTED

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 p 2

[Text]

The Policy Subcommittee of the Aircraft & Machinery Industry Council's Aircraft Division, MITI, met for the third time in Tokyo July 17 and heard a MITI report on the present state of the Japanese aircraft industry and then discussed matters related with possible development of an advanced flyingboat.

Noboru Hatakeyama, director of Aircraft & Ordnance Sec., Machinery & Information Industry Bureau, MITI, briefed the subcommittee on the latest data on investment and production amounts, number of employees and man-hours of the Japanese aircraft industry. Hatakeyama told the subcommittee that the man-hours required for aerospace production in Japan are predicted to gradually decrease from FY '80, and that surplus labor would appear especially in the field of engines. "Japan will have sufficient power to launch a new engine development project from the standpoint of manpower and facilities already invested," he pointed out.

After this, the subcommittee exchanged opinions on flyingboat development. Costs related to development, production, and operation, construction of special airports for the aircraft, demand estimate, safety and possibilities of governmental subsidies for development were discussed. It was decided that a special committee will be organized within the Society of Japanese Aerospace Companies in August for promotion of the flyingboat study.

The subcommittee will meet again in the middle of August to discuss an intermediate report on future policy for Japan's aircraft industry.

CSO: 4120



## SCIENCE AND TECHNOLOGY

### NAL REPORTS ON EXPERIMENTAL STOL PROGRAM

Tokyo JPE AVIATION REPORT-WEEKLY in English 25 Jul 79 p 3

[Text] The National Aerospace Laboratory (NAL) attached to the Science and Technology Agency revealed July 11 the first running test of its experimental USB (upper surface blown) powerplant system which it has designed for its low noise STOL aircraft development project. The test was conducted at NAL's Kakuta Branch in Miyagi Prefecture.

NAL started the project in FY 1977 and plans to complete development work in FY '85 at a cost of approximately ¥8,000 million. An ASDP/Kawasaki C-1 tactical transport will be modified as the STOL airframe, fitted with the FJR-710 turbofan under development by MITI's Agency of Industrial Science and Technology. The project calls for development of a high performance, low noise STOL aircraft, utilizing the USB system.

The July 11 test was a part of NAL's project to obtain data and information necessary for determining the most suitable shape of the engine nacelle. A wing model was vertically constructed on the ground, to which a FJR-710 engine and nacelle were fitted. The engine was installed parallel with the ground so that its exhaust did not touch the ground when it was operated under simulated flight conditions.

Tests will be repeated for about two weeks so that operating conditions and exhaust gas flow of the engine and the temperature changes on the wing surface can be checked. So far, the engine testing has been producing satisfactory results, NAL says.

In addition to the engine testing, various tests in other fields such as aerodynamic, structure and flight controls will also be carried out this fiscal year in preparation for fabrication of an experimental STOL aircraft which is scheduled to begin in FY '80. All tests are on schedule, NAL reports.

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## SCIENCE AND TECHNOLOGY

### TECHNOLOGY SURVEY REPORT SUBMITTED TO COUNCIL

Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 pp 5-6

#### [Text]

The Ministry of International Trade and Industry (MITI) recently released a survey report on advanced aeronautical technology development, which it submitted to the Policy Subcommittee, Aircraft & Machinery Industry Council's Aircraft Division. The report was prepared by a specialist group headed by Prof. Hiroshi Nakaguchi, Faculty of Engineering, Chiba University, organized within the Technical Committee of the Society of Japanese Aerospace Companies (SJAC). The report is summarized below:

1) It can be said that the world's civil aircraft industry will be entering its second technology revolution phase in the near future. The first phase took place around 1955 when the first passenger jets such as the Comet, Boeing 707 and the DC-8 appeared, drastically changing air transportation.

The speed of aircraft was doubled, which resulted in improvement in productivity of the air transport business. The conversion from reciprocating engines to jets also caused reorganization of the aircraft industry. It is safe to say that the winning manufacturers in the initial jet age still dominate the present aircraft market.

Airlines must invest huge amounts for ground support equipment, spares and crew training as well as for aircraft, and once the manufacturer of its aircraft is selected it is difficult for the carrier to switch to another manufacturer because of already established aircraft brand image. Another manufacturer will be chosen only when a new model with exceptionally high performance is available.

2) A quarter century has passed since the first passenger jet was put into service, in the meantime, advancements were made in aeronautical technology such as high-bypass turbofans, widebody airframes and new subsonic wings. Today's technology, however, seems to have reached its limits and further improvements will not be easy. For example, the speed of commercial aircraft has remained almost constant since introduction of

the first jet. On the contrary, speed of passenger aircraft now tends to decrease due to fuel conservation. The bypass ratio of the turbofan will not greatly increase. Problems of the Concorde supersonic transport stem from the fact that its development was based on conventional aeronautical technology.

3) The last commercial aircraft to be developed with present technology will appear in the middle of the 1980s. In the 1990s, the technological revolution is expected to enter its second phase so that aircraft will be able to meet new social requirements. To prepare for the new era, Japan should immediately begin research and studies on a new aeronautical technology.

These studies should be divided into two. One should be studies on energy saving including change of energy sources from petroleum to other products. New applications of aircraft to meet future social requirements is the other. For the former, development of highspeed turboprops, ultra lightweight aircraft and hydrogen-powered aircraft should be considered. For the latter, development of such new types as the LTA (lighter-than-air aircraft), VTOL and free landing aircraft should be promoted.

Apart from development of aircraft, new take-off and landing systems should be developed in order to help solve problems connected with acquiring airport and surrounding land.

4) These technological innovations will not necessarily materialize in the 1990s, but all will be required someday. Aircraft development takes a long period, and large-scale development work carries considerable technical risk. Therefore such work should be promoted as a government sponsored national project.

In the United States, for example, NASA takes some initiatives in research and development of new aeronautical technology. Concerning energy conservation, it inaugurated in 1976 the 10-year Aircraft Energy Efficiency Program (ACEE). For the ACEE, America is estimated to spend during the next ten years approximately \$670 million in 1975 currency.

5) The items mentioned above can be summarized below:

a) It is recommended that Japan should promote development of highspeed turboprops and ultra lightweight aircraft to help conserve fuel. Energy saving aircraft will be required in the future. Although two types of new aircraft are mentioned, technology to be promoted would have common features and should not be specifically separated.

b) Regarding introduction of aircraft applications into new fields, the type of technology differs by need. Therefore, it is recommended that thorough market surveys be conducted before the start of extensive research and development activities.

c) Regarding advanced take-off and landing systems, sufficient data is not available. It is therefore recommended that more thorough studies be made on the above and other items before Japan's future aircraft research and development plans are finalized.

## SCIENCE AND TECHNOLOGY

### REPORT URGES PROMOTION OF STOL STUDIES

Tokyo JPE AVIATION REPORT-WEEKLY in English 1 Aug 79 pp 6-7

[Text]

The Aeronautical Division of the National Aeronautical and Electronic Council submitted an interim report to Iwazo Kaneko, State Minister and Director-General of the Science and Technology Agency July 23 on development of Japan's fanjet STOL study program.

The report said that the program which was initiated by the agency's National Aerospace Laboratory in FY 1975 is generally on schedule, and that necessary funds be appropriated in the future so that experimental STOL aircraft can be completed in FY '83 as originally scheduled.

The program is aimed at promoting research and development of a low noise STOL aircraft which is considered to become one of the most suitable means of commercial air transportation in the 1980s.

Japan's experimental STOL aircraft will be designed to be operated from a 700-meter runway. Fabrication of some components of the aircraft has already begun. NAL made public the first running test of the USB (upper surface blown) type powerplant system of the experimental aircraft at its Kakuta Branch in Miyagi Prefecture as reported previously (No. 431, July 25, 1979 issue).

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SCIENCE AND TECHNOLOGY

EITHER MHI OR IHI WILL BE PRIMED FOR LOX/LH WORK

Tokyo JPE AVIATION REPORT-WEEKLY in English 8 Aug 79 p 10

[Text]

The National Space Development Agency (NASDA) of Japan will appoint by the end of this year either Mitsubishi Heavy Industries or Ishikawajima-Harima Heavy Industries as prime contractor for development of the liquefied oxygen and hydrogen engine, the second stage booster for the H-1 rocket which will be used for launching a 500 kg stationary satellite after 1985. The engine will have a maximum thrust of 10,000 kg.

Development of the fuel system, combustion chamber and fuel tank of the liquefied oxygen and hydrogen engine is under way. Burning tests using a prototype combustion chamber began July 27. Testing of prototype pumping systems for liquefied oxygen and hydrogen will start very soon. Fabrication of a prototype fuel tank is scheduled to begin shortly as basic tests for the tank have been completed.

So far, MHI has been working on the combustion chamber and the fuel tank, and IHI the fuel supply system under separate contracts from the NASDA. It will appoint a prime contractor between the two so that the work is coordinated.

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## SCIENCE AND TECHNOLOGY

### BRIEFS

CAR FUEL ECONOMIZER--Kamiyo Tokki Kogai Kenkyujo (headed by Juichi Kamiyo, 2-7-13, Minowa, Taito-Ku, Tokyo) has developed and tested a so-called "Kaminoru" system employing a special fuel additive for either LPG or gasoline, manifold heat to vaporize the fuel, and other [unspecified] technology to yield a uniform fuel-air mixture and provide uniform fuel charges to all cylinders. The system is claimed to cut fuel consumption almost in half and reduce CO, HC and NOx emissions. Cost of the system is listed as 75,000 yen plus installation (the system can be easily installed at any garage), while fuel savings for a taxi traveling 300 kilometers per day is stated to be 30,000 yen per year. Production for use by fleet owners is targeted at 2,000 units within the year and 10,000 units next year. A T-T model KE system [details unspecified] has been submitted to the U.S. EPA in recent years by the firm. [Tokyo JIDOSHA TIMES in Japanese 15 Jul 79 pp 2-3]

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